WAVETEK

OPERATION MANUAL

MODEL MS1300

SCANNING/LOGGING SIGNAL LEVEL METER

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1 Introducing microSTEALTH

INTRODUCTION

The MS1300 Signal Level Meter is a high performance instrument designed for cable television technicians. The durable, water resistant MS1300 makes innovative use of a graphics LCD to simplify operation. The LCD backlight makes measurements easier in crawl spaces and behind TVs. The display is easy to see in bright sunlight.

A scan mode allows you to see the levels of all carriers in a spectral display. You can also view level measurements at a single frequency or for a specific channel. When tuned to a channel, the display indicates the levels of the video and audio carriers, and the difference between the carrier levels.

When performing an installation, you can press the Installation Check key to quickly verify that all channels are within limits that you have defined. You can use this feature to determine whether or not a subscriber connection meets FCC or other government requirements.

A special channel plan building mode automatically determines which channels are active on your cable system. Once you have defined a channel plan, you can copy it to any MicroStealth unit having a built-in serial port. You can also create channel plans using StealthWare, the Windows™ based data management package for Stealth products.

For documentation purposes, you can print any measurement screen to a serial printer (Wavetek P-Stealth Printer). Following an installation check, you can print an installation report that can be filed with the work order. You can also print a report that lists all configuration settings including the channel plan.

The MS1300 tunes from 45 to 550 MHz with an option to extend the range to 5 to 890 MHz.

MEASUREMENT LOGGING

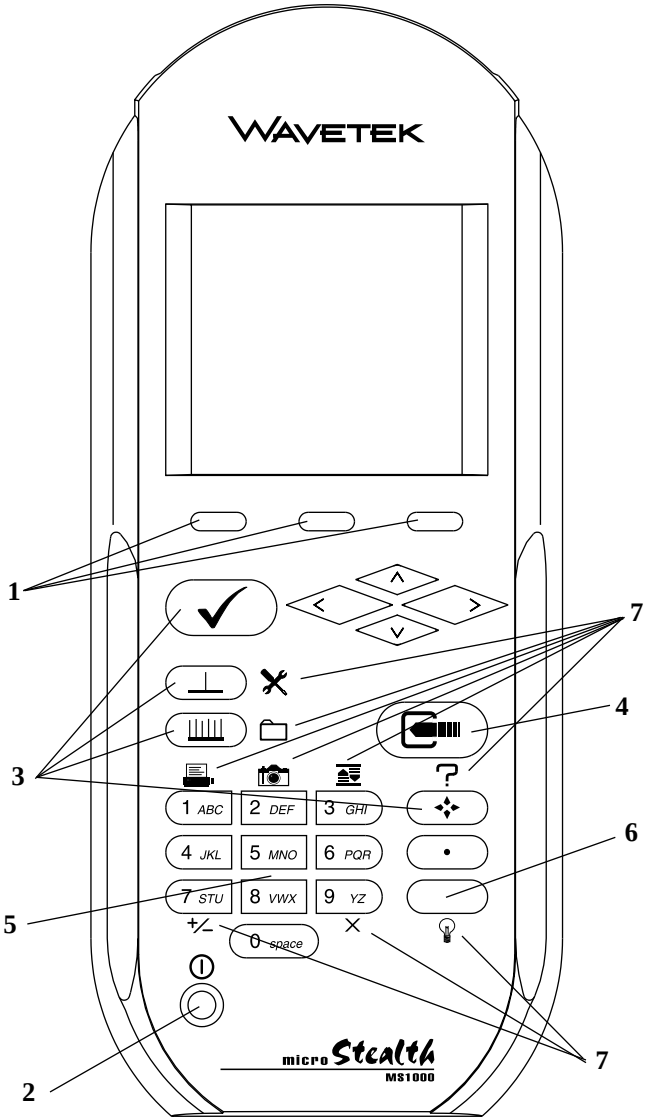
With the MS1300, you can store installation checks that you have performed throughout the day. You can also store scan and tilt measurements. Each file is time and date stamped and can be recalled later for viewing on the LCD screen.

When viewing a file, you can adjust the screen settings the same as when you are viewing a "live" measurement. Using the built-in serial port, you can print files and even upload them to StealthWare for further analysis and archiving.

AUTO TESTS

Automated tests are easy with the MS1300 and provide a convenient way of acquiring proof-of-performance compliance data. Tests can be executed immediately or scheduled over a period of time. To conserve battery life, MicroStealth shuts itself off between scheduled intervals. When configuring an Auto Test, you can record information about the location at which the test is being performed. Files can be created for commonly tested locations so you need only enter the information once.

Auto Tests results are time, date, and temperature stamped and can be viewed on the LCD screen. Limits are applied to the measurement data with out-of-tolerance conditions concisely indicated. You can print a test report for each interval or a comprehensive 24 hour report that summarizes data collected from up to four intervals. Auto Test result files can be uploaded to StealthWare.


WAVETEK
1 ABC
2 DEF
3 GHI
4 JKL
5 MNO
6 PQR
7 STU
8 VWX
9 YZ
+/-
0 space
micro Stealth
MS1000
1
2
3
4
5
6
7
7

MULTIPLE CHANNEL PLANS

The MS1300 stores channel plans that you have built and edited. This is convenient if you use your MicroStealth for more than one plant. You can quickly select the correct channel plan for the plant at which you are working.

GETTING ACQUAINTED WITH THE KEYPAD

The keypad consists of the following:

- three Soft keys
- a Power key
- four Mode Selection keys
- an Enter key
- eleven Alphanumeric keys
- a Shift key

1. SOFT KEYS

There are three horizontally oriented soft keys located below the display. The function of each soft key changes depending on the particular operation being performed and is represented by an icon immediately above the key.

2. ⏻ POWER KEY - ON/OFF

Turns your microStealth on and off.

3. MODE SELECTION KEYS

✓ **INSTALLATION MODE**

Easily check the channels that you have installed and verify that they are within limits.

LEVEL MODE

Measure the signal level at a specific channel or frequency.

FULL SCAN MODE

View a spectrum graph of all carrier levels in your channel plan.

NAVIGATOR

Instantly "travel" to any mode using the NAVIGATOR.

4. ENTER KEY

Press this key to terminate your entry or selection.

5. ALPHANUMERIC KEYS

You use the alphanumeric keys to enter data while operating your microStealth. Notice that these keys have a numeral and up to three alphabetic characters labeled on them. You can only access the characters when alphanumeric entry is allowed. In the alphanumeric entry mode, you sequence through each character and the numeral by repeatedly pressing the key. You can also access a set of special characters that do not appear on the keypad by using the up and down arrows. Once the desired character is displayed, move the cursor to the next position using the right arrow. Be sure to terminate your entry by pressing the key.

6. SHIFT KEY

Some keys perform more than one function. The secondary function of a key is represented by an icon printed next to it. Notice that the icons are color coded with the **SHIFT** key. You access the secondary function by first pressing the **SHIFT** key and then the icon representing the desired function.

7. SECONDARY FUNCTIONS

CONFIGURE MODE

Configure your microStealth for your own specific needs.

AUTO REFERENCE

Let microStealth automatically set the reference level for you.

SNAP SHOT

Hold the measurement. The measurement is retained even if the cable is disconnected from the input.

CLEAR

Clear-out your entry and start over again.

BACKLIGHT ON/OFF

Quickly turn the backlight on when it is too dark to see the display.

POSITIVE/NEGATIVE

Enter positive and negative values (when allowed).

HELP

View a description of each icon found in the current soft key menu.

PRINT

Print a measurement screen, installation report, auto test report, or configuration report to a serial printer.

STORE FILE

Store an Installation, Scan, or Tilt screen for later viewing, printing or uploading to StealthWare.

GETTING ACQUAINTED WITH THE SCREEN

There are certain elements of the screen that will become familiar to you as you use your microStealth.

The Title Bar

Notice the title bar at the very top of the screen. It presents the title and icon for the current mode you are using.

Title Bar Indicators
You may see indicators appear above the title bar from time to time. This is what they represent:

This indicator appears in the top right-hand corner of the screen when you press the SHIFT key. This means that microStealth interprets the next key that you press to be a secondary function.

This indicator is displayed to warn you that the battery is low. When you see this, recharge the battery or change to a fresh one as soon as possible.

This indicates that the RF synthesizer has become unlocked. If this condition persists, the unit may need repair.

The Status Bar
Look for the status bar in the lower portion of the screen. It displays the current date and time. A bar meter indicates the charge remaining in your MicroStealth's battery. When the battery meter reads low, you should switch to a freshly charged battery soon.

Note
When viewing an Installation or Scan file, the status bar shows the date and time that the file was stored instead of the current date and time.

Soft Key Icons
There are three soft keys located immediately below the display. The function of a soft key is represented by the icon directly above it.

Note
If the soft key function is not currently available, the icon appears "grayed" or "dimmed".

Lists
Lists present several items for viewing and/or selecting. Notice that the currently chosen item is highlighted. You can scroll through the list using the up and down arrows.

A list can be either "active" or "inactive". You can tell by looking at the border. If the border is solid, the list is active and any keys that you press are directed toward it. If the border is dim, the list is inactive and is not affected by key presses. Usually you can make a list become active by pressing the key.

When there are more items in the list than can be displayed at one time, a scroll bar appears along the right-hand edge of the list. You can use this to get an idea of where you are. When you have reached the first or last item, an arrow appears inside the scroll box pointing to the direction you can go.

The Edit Box
The edit box appears in the lower portion of the screen when it is necessary to enter values into your microStealth.

An edit box can be either “active” or “inactive”. You can tell by looking at the border. If the border is solid, the edit box is active and any keys that you press are directed toward it. If the border is dim, the edit box is inactive and is not be affected by key presses. Usually, you can make the edit box become active by pressing the key. Be sure to press the again when you have finished making you entry.

THE NAVIGATOR

You can easily travel to any mode using the NAVIGATOR. To access the NAVIGATOR, press the key.

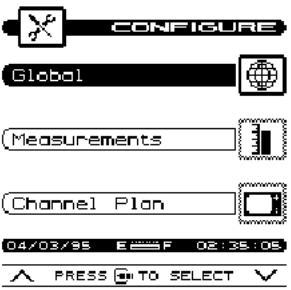
An icon appears on the screen for each available mode. Use the up, down, left, and right arrows to highlight the icon that represents the mode you want to use. Notice that the name of the mode appears on the lower portion of the screen beneath the status bar. To get a description of the highlighted mode, press the SHIFT + key. To travel to the mode you have highlighted, press any one of the soft keys or the key.

Tip
You can also use the numeric keys, 1 through 9 to highlight the desired icon in the NAVIGATOR screen. Each key corresponds to an icon in the 3 by 3 matrix.

CONFIGURING microSTEALTH

Before using your microStealth, you may want to configure it for your specific needs. The CONFIGURE mode allows you to select global and measurement related preferences and to build and edit a channel plan that matches your cable plant.

To configure your microStealth, press the SHIFT + keys or choose the icon from the NAVIGATOR. The following screen appears:



Configuration settings are divided into three categories; GLOBAL, MEASUREMENTS, and CHANNEL PLAN. Use the up and down arrows to highlight the category you want and then press the key.

Tip
You can also use the left-hand and right-hand soft keys to scroll through the CONFIGURE categories and then press the middle soft key to select the highlighted category.

PRINTING A CONFIGURATION REPORT
In most configuration screens, you can print a comprehensive configuration report by pressing the SHIFT + keys. A bar graph appears indicating the status of the printout. The report lists all of the configurable settings including the active channel plan.

Global Configuration

OPERATOR NAME
You can personalize your microStealth by entering your name here. Your name will then appear on report printouts.

CONTRAST LEVEL
Adjusts the contrast level of the LCD for optimum viewing.

SHUTOFF TIME-OUT
Sets the amount of inactive time allowed before your microStealth turns off automatically. This feature is useful for conserving battery life by preventing the microStealth from being left on accidentally when it is not in use. You can set the time-out period to 1, 3, or 5 minutes. There is also an "always on" setting that defeats the automatic shutoff feature if desired.

Note
You can manually turn off your microStealth at any time by pressing the ⏻ button.

BACKLIGHT TIME-OUT
Sets the amount of inactive time allowed before the backlight turns off automatically. The backlight consumes significant power. This feature conserves battery life by minimizing the amount of time that the backlight is on. You can set the time-out period to; 5 or 10 seconds. There is an always off setting for when the backlight is not needed at all. There is also an always on setting that defeats the backlight time-out feature.

You can manually turn the backlight on or off at any time by pressing the SHIFT + 💡 keys. When manually activated, the backlight remains on continuously until the unit shuts off.

Tip
You can tell when the backlight is on even in bright sunlight by looking for the backlight indicator at the left-hand edge of the Title Bar. The ✱ indicator means that the backlight is currently on and will turn off automatically. The ✚ indicator means that the backlight is on and will remain on continuously. If you see no indicator, the backlight is off.

TIME
Sets the time for the internal real-time clock. The time is set, displayed and printed in 24 hour format only (HH:MM:SS).

DATE FORMAT
You can specify the format in which the date is displayed and printed. Select between the following formats:

MM/DD/YY
DD.MM.YY
YY.MM.DD

DATE
Sets the date for the internal real-time clock. You can specify the format in which the date is set, displayed and printed (see DATE FORMAT).

PRINTER
Select the manufacturer of the printer that you will be using. A printer with a serial interface is required. Set your printer configuration as follows:

Baud Rate:	same as your microStealth
Date Bits:	8
Stop Bits:	1
Parity:	NONE
Flow Control:	Xon/Xoff

Important
The baud rate of both your microStealth and your printer must match (see BAUD RATE).

Tip
A serial to parallel converter (such as the on manufactured by Black Box Corp.) can be used for printing to a parallel printer.

LINES/PAGE
For text reports, you can specify the number of lines that will be printed on each page before a form feed command is sent. Enter 0 if you do not want any form feeds to be sent.

BAUD RATE
This is the baud rate that is used when your microStealth communicates with another device through the serial port. Generally, you will want to use the highest rate supported. Be sure that the baud rate setting of your microStealth matches that of the device that it is connected to.

CLONE
You can easily transfer the entire configuration from one microStealth unit to another. This saves you time when configuring multiple units. First, connect a cable between the two microStealth units. Select CLONE **only on the unit that you want to copy the configuration to.** Press the OK soft key to begin the transfer.

Important
Be sure that the baud rate setting of your microStealth matches that of the device that it is connected to (see BAUD RATE).

DIAGNOSTICS
Performs hardware diagnostics and defaults stored preferences to factory presets. Press the ↵ key to access the diagnostics options.

> **Factory Default**
> Sets all stored preferences to factory presets. Press the ↵ key to initiate the default operation.
>
> **Important**
> All stored settings are lost when you perform this operation.

Test Display
Exercises all pixels on the LCD for test purposes. Repeated pressing of the key sequences the display between all pixels "on", all pixels "off", and the display test screen.

Measurements Configuration

TEMPERATURE UNITS
Selects the units that will be used for the ambient temperature during Auto tests. You can select between; °C and °F.

SIGNAL LEVEL UNITS
Selects the units that will be used for all signal level measurements. You can select between; dBmV, dBµV and dBm.

PROBE COMPENSATION
This can be used to compensate for losses associated with probe points found on certain amplifiers. You can enter a value between -99.9 and +99.9 dB. Probe compensation is added directly to signal level measurements. The compensation value is indicated in the upper left-hand corner of the measurement screens. There is no indication, however, if the compensation value is zero.

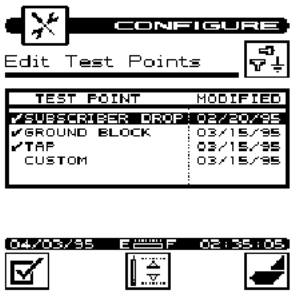
Important
The PROBE COMPENSATION value **does not affect INSTALLATION or CHANNEL PLAN BUILD mode**. Level measurements made while checking an installation are uncompensated.

FREQUENCY TUNING STEP SIZE
This setting affects the increment/decrement step size when you are tuning the frequency using the left and right arrows. You can select a value between 25kHz and 100MHz in steps of 25kHz.

SCAN AUDIO CARRIERS
Select YES if you want to see the audio carriers in the full scan screen. You can achieve a faster scan by omitting the audio carriers.

SCAN SCRAMBLED CHANNELS
Scrambled channels require more time to measure. You can achieve a faster scan by omitting scrambled channels. Select YES if you want to see scrambled channels in the full scan screen.

EDIT TEST POINTS
Your microStealth is capable of performing tests at various locations including; SUBSCRIBER DROP, GROUND BLOCK, TAP, and USER DEFINED (or CUSTOM). Each test point has its own set of limits that you can edit. Press the ⏎ key to edit the test points. A list of available test points appears.



You can enable or disable each test point in the list. When a test point is disabled, you cannot use it when performing tests. Use the up or down arrow to highlight the desired test point. If the highlighted test point is disabled, you can enable it by pressing the ☑ soft key. A check mark appears in the left-hand column to indicate when a test point is enabled. If the test point is already enabled, pressing the ☑ soft key disables it.

Tip
You can change the name of the USER DEFINED (CUSTOM) test point. Notice that the edit box appears when this test point is highlighted. When you press the ⏎ key, the edit box becomes active and you can enter any name up to fifteen characters long. Be sure to press the ⏎ key when finished to terminate your entry.

You can edit the limits for the highlighted test point by pressing the soft key. The limits appear on the screen.

You can selectively enable or disable each individual limit. When a limit is disabled, your microStealth excludes it when checking limits. If the highlighted limit is disabled, you can enable it by pressing the soft key. A check mark appears in the left-hand column to indicate when a limit is enabled. If the limit is already enabled, pressing the soft key disables it.

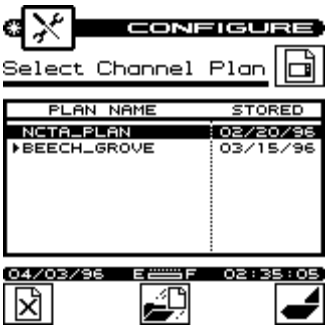
Note
If you disable all of the limits within a test point, the test point becomes disabled. You cannot enable a test point that has no enabled limits.

You can edit the value of the highlighted limit by pressing the key. When the edit box becomes active, enter the desired value. Be sure to press the key when finished to terminate your entry.

Press the soft key to return all limits in the test point to their factory preset values.

Channel Plan Configuration

SELECT CHANNEL PLAN
Channel plans are stored automatically when they are created. Use this option to select from a list of available plans.



A small arrow appears in the list to the left of the name of the currently active plan. To load a different plan, use the up and down arrows to highlight the desired plan and then press the . Press the soft key to delete the highlighted plan.

Note
The currently active plan cannot be deleted. To delete this plan, you must first load a different plan.

Tip
You can rename the plan highlighted in the directory by pressing the SHIFT + keys. A screen will appear asking you to enter a new name.

VIDEO SIGNAL TYPE
Your microStealth is capable of measuring signal levels on NTSC or PAL video signals. You should make sure that the correct video type is selected.

CHANNEL SEQUENCE
You can specify whether channels are listed in numeric or frequency order. This setting also affects the sequence in which channels are tuned in the LEVEL screen when using the left and right arrows.

Note
The SCAN screen always displays channels in order of frequency regardless of the CHANNEL SEQUENCE setting.

BUILD CHANNEL PLAN
Your microStealth is capable of identifying which channels are on your cable plant. This allows you to quickly and easily generate a customized channel plan. Press the ↵ key and let microStealth learn your system.

Important
Ensure that your microStealth is connected to the cable system before initiating this procedure.

Step 1
You are asked to enter a name for the channel plan. Using the edit box, you can enter any name up to fifteen characters long. Be sure to terminate your entry with the ↵ key. Press the OK soft key to continue with the next step.

Step 2
There are several standard channel plans to use as a foundation for building your plan. Use the up or down arrows to highlight the one that is appropriate for your system. Press the OK soft key to continue with the next step.

Step 3

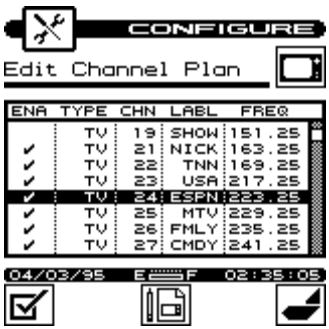
You can tell microStealth what frequency to stop searching for channels. This will save time when building the plan. The frequency you enter should be just above the highest channel on your system. If you are not sure what the frequency of your highest channel is, just use the default value that appears in the edit box. If you have entered a value, be sure to terminate your entry with the ⏎ key.

Press the OK soft key to begin building the plan.

Upon pressing the OK soft key, microStealth begins searching your system for active channels. A bar graph indicates the percentage of the channels searched. After the plan has been built, press the soft key to return to the Channel Plan Configuration screen.

EDIT CHANNEL PLAN

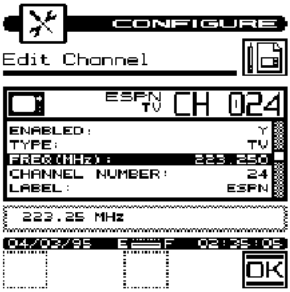
You can edit various parameters for each channel. Press the ⏎ key to edit the channels. A list of all the channels in the plan appears.


CONFIGURE
Edit Channel Plan
ENA TYPE CHN LABL FREQ
TV 19 SHOW 151.25
✔ TV 21 NICK 163.25
✔ TV 22 TNN 169.25
✔ TV 23 USA 217.25
✔ TV 24 ESPN 223.25
✔ TV 25 MTV 229.25
✔ TV 26 FMLY 235.25
✔ TV 27 CMDY 241.25
04/03/95 E F 02:35:05

A check mark appears in the left-hand column when the channel is enabled. When you built the channel plan, MicroStealth automatically enabled all the channels it found to be active on your system. You may want to verify that all your channels have been correctly enabled. Use the ☑ soft key to enable/disable the channel highlighted in the list.

Important
You must enable a channel in order to perform measurements on it.

There are several parameters that you can specify for each channel. To do this, highlight the desired channel using the up or down arrow and press the soft key or the key. The parameters for that channel appear.



Use the up or down arrow to highlight the desired parameter. Press the key to edit the selected parameter. After completing your entry, be sure to press the key again.

Enabled
As mentioned earlier, a channel must be enabled in order for it to be measured. This is another place where you can enable or disable the channel.

Type
There are three channel types from which to choose:

TV -the standard video and audio carriers
DUAL -a video carrier with two independent audio carriers (a European format)
SNGL -a single carrier

Frequency
This is the frequency of the video carrier in MHz.

Channel Number
The channel number can range from 1 to 999.

Label
You can enter a label up to four characters in length for each channel. This label appears next to the channel number on most screens to help you to remember what programming is on that channel.

Package
You can organize channels into packages. In the edit box, you can select any package that is enabled (see the section on CHANNEL PACKAGES). When you are checking an installation, you can specify which packages the subscriber has ordered and your microStealth will verify that the channels are correctly installed.

Scrambled
If the channel is scrambled, select YES here so that accurate measurements can be made.

Important
microStealth supports several scrambling formats including the following:

Horizontal Sync Suppression

Audio Offset (TV and DUAL type only)
This is the offset between the video and audio carriers in MHz.

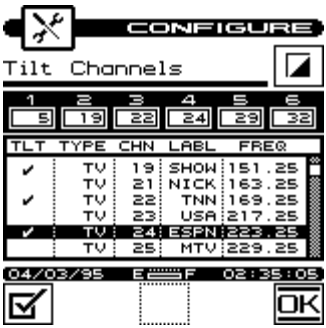
Audio Offset 2 (DUAL type only)
This is the offset between the video and second audio carriers in MHz.

When you are finished editing the channel, press the OK soft key to return to the channel list.

Tip
Notice that the selected channel number is displayed in the upper right-hand corner of the parameter list. When the list is active, you can use the left or right arrows to select the previous or next channel in the plan. You can also use the numeric keys to directly enter a specific channel number.

SELECT TILT CHANNELS

Press the key to specify which carriers to measure on the TILT screen. A list of all enabled channels in the current plan appears.



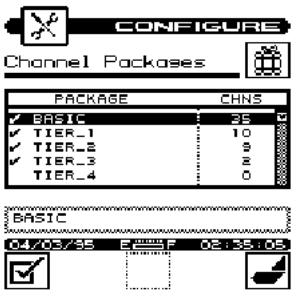
Up to six channels can be selected. To select a channel, use the up or down arrow to highlight the desired channel in the list, then press the ☑ soft key. A check mark appears in the left-hand column of the list indicating that this is now a TILT channel. Also, the channel number appears in one of the six boxes above the list. Press the ☑ a second time to deselect the TILT channel.

Note
The TILT channel numbers are displayed above the list in order of increasing frequency — not in the order in which they were selected.

When you have finished, press the OK soft key.

CHANNEL PACKAGES
Channel packages allow you to organize channels into groups or tiers. You can specify which channels you have installed for a subscriber when checking an installation. Your microStealth can then determine if the channels are installed properly.

Press the ⏎ key to display a list of channel packages.



These are the packages that will be available to you when you edit a channel. You will be able to select from one of these packages for each channel in the plan.

To enable a package, press the ☑ soft key. A check mark appears in the left-hand column to indicate that the package is enabled. If the package is already enabled, pressing the ☑ soft key disables it. You will be asked to verify your intention to disable the package.

Important
The number in the right-hand column of the package list indicates how many channels are currently using the package. When you disable a package, all channels using that package default to NONE (no package).

To edit the name of a package, use the up or down arrow to highlight the desired package and then press the ⏎ key. You can then use the edit box to change the name. Be sure to press the ⏎ key when you are finished to terminate the entry.

Tip
There is no minimum on the number of channels that a package can contain. If you want, you can create a package for only one channel.

COPY REMOTE PLAN
You can easily copy a channel plan from one microStealth unit to another. This saves you time when configuring multiple units. First, connect a cable between the two microStealth units. Select COPY REMOTE PLAN **only on the unit that you want to copy the channel plan to.** A list of all available channel plans found on the remote unit appears. Use the up or down arrow to highlight the plan that you want to copy. Press the OK soft key to begin copying the plan.

Important
Be sure that the baud rate setting of your microStealth matches that of the device that it is connected to (see BAUD RATE).

2 Using microSTEALTH

INTRODUCTION

The best way to learn about microStealth is to use it. Section *2* discusses the individual measurements available with the MS1300. Each measurement mode discussion includes detailed descriptions on how to perform the measurement as well as operating controls and indicators.

INSTALLATION

The INSTALLATION mode allows you to easily check the channels that you have just installed and verify that they are within limits. If you have configured channel packages, you can tell your microStealth which packages the subscriber has ordered and it will display only those channels.

Press the ✓ key to select the INSTALLATION mode or choose the ☑ icon from the NAVIGATOR. Your microStealth will begin measuring all the enabled channels in the plan. A bar graph indicates the percentage of channels measured. When microStealth has finished, you can view the results and verify that all channels are within limits.

SELECTING CHANNEL PACKAGES

If you have configured channel packages, a list of available packages will appear. From this list, you can select the packages that the subscriber has ordered. The number to the right of the package name tells you how many channels are included in each package. Use the up or down arrows to highlight a package and then press the soft key to select it. A check mark appears in the left-hand column of the list indicating that the package is selected. If the highlighted package is already selected, pressing the soft key deselects it.

Tip
Select "ALL CHANNELS" if you want to include **all** the enabled channels in the plan.

Press the soft key or when you have finished. Now your microStealth will only evaluate the channels from the packages that you have selected.

Tip
You can return to this screen at any time to change your package selection by pressing the soft key.

SELECTING THE TEST POINT

The next thing you should do is tell microStealth at which test point you are located. This determines which set of limits are used. Press the soft key to sequence through the available test points. The test point that you have selected is represented in the upper portion of the screen by one of the following icons:

Subscriber Drop
Ground Block
Tap
User Defined

Note
Be sure that you have enabled all of the test points that you are interested in using. The soft key is only available if there is more than one enabled test point. (see EDIT TEST POINTS).

Important
Only the limits that are enabled in the selected test point are checked (see EDIT TEST POINTS).

INSTALLATION RESULTS SUMMARY
This is the overall limit check summary for all channels in the packages that you have selected.

To quickly determine the status of the overall limit check, look at the PASS/FAIL indicator located in the upper portion of the screen. This indicates FAIL if any channel is not within the required limits. For each limit, the worst case actual value is displayed along with a pass/fail status.

Note
Only the limits that are enabled in the selected test point appear on this screen. If there are no enabled test points, this screen will not be available. You can however, view the CHANNEL LIST and CHANNEL MEASUREMENT screens described below.

THE CHANNEL LIST

Press the soft key or to sequence to the channel list screen.

Tip

In addition to using the and keys, you can also use the left and right arrows to sequence through the results screens.

The channel list provides essential information about each channel.

INSTALLATION
Subscriber Drop
P A S S
CHN LABL dBmV PKG P/F
19 SHOW -17.7 TIER_2 ✖
21 NICK +0.1 BASIC ✓
22 TNN +4.5 BASIC ✖
23 USA +1.4 BASIC ✓
24 ESPN +0.8 BASIC ✓
25 MTV +2.6 BASIC ✓
E F

In the list you will find the channel number in the first column followed by the label. The level of the video carrier is in the next column. The package in which the channel is contained is displayed in the fourth column. Finally, the overall limits pass/fail result for the channel is found in the last column.

THE PASS/FAIL INDICATOR

Use the PASS/FAIL indicator located directly above the channel list to quickly determine whether the highlighted channel has passed the limits check. If the channel failed, you can identify the reason(s) for the failure by looking at the symbols that appear in this indicator.

Adjacent Channel Failures

CHAN lower adjacent channel level

CHAN upper adjacent channel level

CHAN both upper and lower adjacent channel levels

Video Level Failures

VID ▲ video level too high

VID ▼ video level too low

DVA Failures

DVA ▲ DVA too high

DVA ▼ DVA too low

CHANNEL MEASUREMENT

Press the soft key or to sequence to the channel measurement screen.

This screen displays video and audio carrier level measurements along with the DVA for the selected channel. Use the up or down arrows to select the previous or next channel in the list.

PRINTING AN INSTALLATION REPORT

Press the SHIFT + keys to print a comprehensive report of the installation results. A bar graph appears indicating the status of the printout. The report lists level measurements for all the channels that you installed and indicates out-of-limit conditions with an overall PASS/FAIL conclusion. Space is provided for you to fill in subscriber information. You can attach the report to your work order or file it for future reference.

STORING INSTALLATION RESULTS

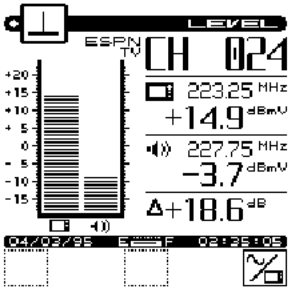
Press the SHIFT + keys to store the results of the installation check into a file. A screen will appear asking you to enter a name for the file. See the section on VIEW mode to find out how to access files that you have stored.

Tip

The results from the most recent installation check are stored automatically. If you have selected another mode and wish to return to viewing the installation results you can do so without having to repeat the measurement process. Simply press the SHIFT + keys and the results of the most recent installation check will appear.

LEVEL

Press the key to select LEVEL mode or choose the icon from the NAVIGATOR. Here you can measure the signal level of a specific channel or frequency. The level is indicated both numerically and on an analog meter.



ADJUSTING THE REFERENCE LEVEL

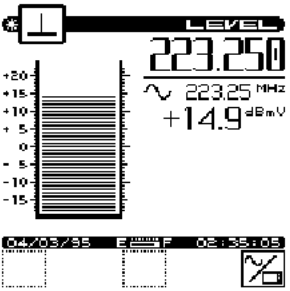
You can adjust the reference level setting of the analog bar meter using the up and down arrows. When you press the SHIFT + keys, your microStealth automatically sets the optimum reference level for you.

TUNING BY CHANNEL

When you are tuned to a channel, both the video and audio carriers of the channel are measured and displayed simultaneously. The difference between the video and audio carriers (DVA) is also shown. The channel number, type and label for the channel that you are currently tuned to appear in the upper right-hand portion of the screen. You can use the left or right arrows to tune to the previous or next enabled channel in the plan. You can also use the numeric entry keys to tune directly to the desired channel. Press the soft key to tune by frequency.

TUNING BY FREQUENCY

The soft key toggles between frequency and channel tuning. When you choose frequency tuning, microStealth tunes to the video carrier frequency of the previously selected channel.



Use the left and right arrows to tune your microStealth. The frequency increments or decrements by the step size that you have specified in the Measurement configuration (see FREQUENCY TUNING STEP SIZE). You can also use the numeric entry keys to tune directly to the frequency desired.

MEASUREMENT HOLD

You can freeze the level measurement at any time by pressing the SHIFT + keys. The measurement is retained even if the cable is disconnected from the input port. Notice that the mode icon in the upper left-hand portion of the screen flashes when the measurement is on hold. Press the SHIFT + keys again to release the hold. The hold is also released when you tune to a different channel or frequency. The measurement is not retained when another mode is selected or the microStealth is shut off.

PRINTING THE SCREEN

You can print the entire screen at any time by pressing the SHIFT + keys. A bar graph appears indicating the status of the printout.

Tip

If you are using your microStealth at a location where it is not convenient to connect to a printer (such as on a pole), you can put the measurement on hold until you are able to access the printer.

WARNING INDICATORS
If the current measurement is inaccurate due to an out-of-range condition or hardware failure, microStealth warns you by dimming the numeric measurement value and displaying one of the following warning indicators.

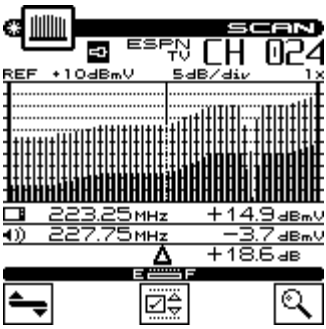
Over-range
The signal level is above the measurement range of the instrument.

Under-range
The signal level is below the measurement range of the instrument.

Error
A hardware problem exists. If this condition persists, the unit may need repair.

FULL SCAN

Press the key to select the FULL SCAN mode or choose the icon from the NAVIGATOR. A spectral graph of all the carriers in the channel plan appears.



MOVING THE MARKER

A vertical marker appears over the currently selected channel. The channel number, type and label appear in the upper right-hand portion of the screen. The frequency and level of the video and audio carriers for the selected channel can be seen directly beneath the graph. You can use the left or right arrows to select the previous or next channel. You can also use the numeric entry keys to tune directly to the desired channel.

ADJUSTING THE REFERENCE LEVEL

The reference level setting is displayed above the graph. This is the level at the very top line. You can adjust the reference level using the up and down arrows. When you press the SHIFT + keys, your microStealth automatically sets the optimum reference level for you.

ADJUSTING THE SCALE

The scale setting is displayed above the graph. You can adjust the scale to provide the best view of the carrier levels by pressing the soft key. A new set of soft keys appear. Use the and soft keys to increment and decrement the scale value. Press the soft key when you have finished.

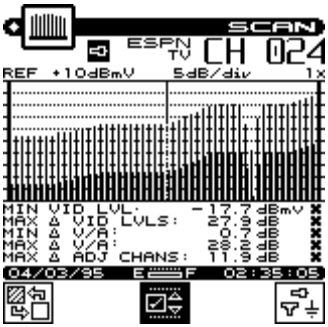
ZOOMING IN AND OUT

To zoom in on or out from the channel selected by the marker, press the soft key. A new set of soft keys appear. Use the soft key to zoom in and the soft key zoom out. The magnification factor is displayed above the graph. Press the soft key when you have finished.

CHECKING LIMITS

You can verify that the carrier levels are within limits. First, you need to tell microStealth which test point you are at. This determines which set of limits are used.

Press the soft key to access the limits submenu. A new set of soft keys appear.

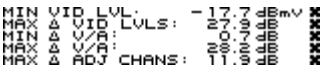


Press the soft key to sequence through the available test points. The test point that you have selected is represented in the upper portion of the screen by one of the following icons:

- Subscriber Drop
- Ground Block
- Tap
- User Defined

Note
Be sure that you have enabled all of the test points that you are interested in using. The soft key is only available if there is more than one enabled test point. (see EDIT TEST POINTS).

When you have selected the limits submenu, the marker information below the graph is replaced by the overall limit check summary for channels **currently being displayed on the graph**. For each limit, the worst case actual value is displayed along with a pass/fail status. The results are updated upon the completion of each scan.



Important
The limit check results apply only to the channels currently being displayed on the graph — not the entire channel plan.

Note
Only the limits that are enabled in the selected test point appear on this screen.

Your microStealth can indicate the minimum and maximum carrier level limits on the graph. The out-of-limit portions appears as diagonal "hash" areas. You can toggle the hash lines on and off by pressing the key.

Note
The limit check results are updated with each scan. They are also update immediately when you press the or soft keys.

When you are finished viewing the overall limit results, press the soft key to return to the main menu.

CHECKING LIMITS ON AN INDIVIDUAL CHANNEL
Indicators appear in the marker information area when a channel is outside the limits of the currently selected test point.

Up or down arrows to the left of the video level and DVA numeric measurement tell you when the limits have been exceeded.

measurement too high
measurement too low

When an adjacent channel error occurs, one of the following indicators will appear in the lower left-hand area of the marker information area:

CHAN	lower adjacent channel level
CHAN	upper adjacent channel level
CHAN	both upper and lower adjacent channel levels

MEASUREMENT HOLD

You can freeze the scan measurement at any time by pressing the SHIFT + keys. The measurement is retained even if the cable is disconnected from the input port. Notice that the mode icon in the upper left-hand portion of the screen flashes when the measurement is on hold. Press the SHIFT + keys again to release the hold. The measurement is not retained when another mode is selected or the microStealth is shut off.

PRINTING THE SCREEN

You can print the entire screen at any time by pressing the SHIFT + keys. A bar graph appears indicating the status of the printout.

STORING A SCAN FILE

Press the SHIFT + keys to store the current scan measurement into a file. A screen will appear asking you to enter a name for the file. Once stored, you will be able to recall the file at a later time and view it on the Scan screen. You will be able to adjust the screen settings the same as when you are viewing a “live” measurement. See the section on VIEW mode to find out how to access files that you have stored.

WARNING INDICATORS
If the current measurement is inaccurate due to an out-of-range condition or a hardware failure, MicroStealth warns you by displaying one of the following warning indicators to the left of the numeric level measurement in the marker information area:

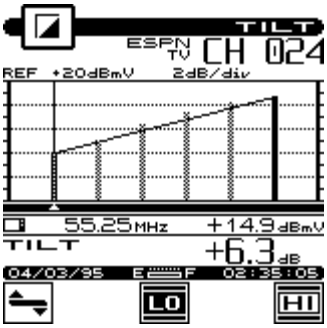
Over-range
The signal level is above the measurement range of the instrument.

Under-range
The signal level is below the measurement range of the instrument.

Error
A hardware problem exists. If this condition persists, the unit may need repair.

TILT

TILT mode simplifies the process of balancing an amplifier. TILT mode can only be accessed by choosing the icon from the NAVIGATOR. A spectral graph of the TILT carriers appears.



Important
You can choose which carriers appear on this screen when you configure your channel plan (see SELECT TILT CHANNELS).

MOVING THE MARKER
You can view up to six carriers. A vertical marker appears over the currently selected carrier. The channel number, type and label appear in the upper right-hand portion of the screen. The frequency and level of the selected carrier can be seen directly beneath the graph. You can use the left or right arrows to select the previous or next carrier.

SELECTING THE LOW AND HIGH CARRIERS
Notice that the bars representing the low and high pilots are solid and all others are dim. You can select which carriers are used for the tilt measurement. To select the low pilot carrier, move the cursor to the desired carrier and press the LO soft key. To select the high pilot carrier, move the cursor to the desired carrier and press the HI soft key. The tilt measurement is calculated from the low and high pilot carriers that you have selected.

ADJUSTING THE REFERENCE LEVEL
The reference level setting is displayed above the graph. This is the level at the very top line. You can adjust the reference level using the up and down arrows. When you press the SHIFT + keys, your microStealth automatically sets the optimum reference level for you.

ADJUSTING THE SCALE
The scale setting is displayed above the graph. You can adjust the scale to provide the best view of the carrier levels by pressing the soft key. A new set of soft keys appears. Use the and soft keys to increment and decrement the scale value. Press the soft key when you have finished.

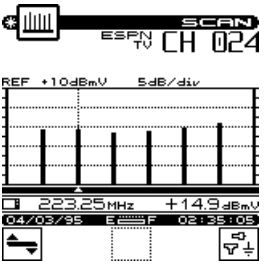
MEASUREMENT HOLD
You can freeze the tilt measurement at any time by pressing the SHIFT + keys. The measurement is retained even if the cable is disconnected from the input port. Notice that the mode icon in the upper left-hand portion of the screen flashes when the measurement is on hold. Press the SHIFT + keys again to release the hold. The measurement is not retained when another mode is selected or the microStealth is shut off.

PRINTING THE SCREEN
You can print the entire screen at any time by pressing the SHIFT + keys. A bar graph appears indicating the status of the printout.

STORING A TILT FILE
Press the SHIFT + keys to store the current tilt measurement into a file. A screen will appear asking you to enter a name for the file. Once stored, you will be able to recall the file at a later time and view it on the Tilt screen. You will be able to adjust the screen settings the same as when you are viewing a "live" measurement. See the section on VIEW mode to find out how to access files that you have stored.

SCAN

The MS1300 includes an additional SCAN mode that can display up to six video carriers. You can access this mode by choosing the icon from the NAVIGATOR.



Note
The channels that appear on this screen are the same ones that you selected when you configured your tilt channels. (see SELECT TILT CHANNELS).

MOVING THE MARKER
A vertical marker appears over the currently selected carrier. The channel number, type and label appear in the upper right-hand portion of the screen. The frequency and level of the selected carrier can be seen directly beneath the graph. You can use the left or right arrows to select the previous or next carrier.

ADJUSTING THE REFERENCE LEVEL
The reference level setting is displayed above the graph. This is the level at the very top line. You can adjust the reference level using the up and down arrows. When you press the SHIFT + keys, your microStealth automatically sets the optimum reference level for you.

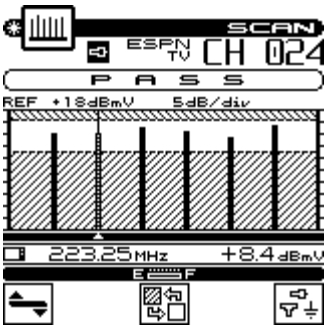
ADJUSTING THE SCALE
The scale setting is displayed above the graph. You can adjust the scale to provide the best view of the carrier levels by pressing the soft key. A new set of soft keys appears. Use the and soft keys to increment and decrement the scale value. Press the soft key when you have finished.

CHECKING LIMITS
You can verify that the carrier levels are within limits. First, you need to tell microStealth which test point you are at. This determines which set of limits are used. Press the soft key to sequence through the available test points. The test point that you have selected is represented in the upper portion of the screen by one of the following icons:

- Subscriber Drop
- Ground Block
- Tap
- User Defined

Note
Be sure that you have enabled all of the test points that you are interested in using. The soft key is only available if there is more than one enabled test point. (see EDIT TEST POINTS).

When you have selected the proper test point, microStealth shows the minimum and maximum carrier level limits for that test point on the graph. The out-of-limit portions appears as diagonal "hash" areas. You can toggle the hash lines on and off by pressing the key.



You can quickly check to see if all SCAN carriers are within limits by looking at the PASS/FAIL indicator above the graph.

MEASUREMENT HOLD
You can freeze the scan measurement at any time by pressing the SHIFT + keys. The measurement is retained even if the cable is disconnected from the input port. Notice that the mode icon in the upper left-hand portion of the screen flashes when the measurement is on hold. Press the SHIFT + keys again to release the hold. The measurement is not retained when another mode is selected or the microStealth is shut off.

PRINTING THE SCREEN
You can print the entire screen at any time by pressing the SHIFT + keys. A bar graph appears indicating the status of the printout.

STORING A SCAN FILE

Press the SHIFT + keys to store the current scan measurement into a file. A screen will appear asking you to enter a name for the file. Once stored, you will be able to recall the file at a later time and view it on the Scan screen. You will be able to adjust the screen settings the same as when you are viewing a "live" measurement. See the section on VIEW mode to find out how to access files that you have stored.

AUTO TEST

Your MicroStealth is capable of performing unattended, automated level measurement sequences. The sequences can be programmed to repeat over a period of time. Measurement data is stored into a file that can be viewed, printed or uploaded to StealthWare. See the section on VIEW mode to find out how to access files from Auto Tests that you have performed.

Important

When performing an Auto Test, only the channels enabled in the currently selected channel plan are measured.

CONFIGURING AN AUTO TEST

Choose the icon from the NAVIGATOR to configure an automated test sequence. Your MicroStealth will guide you step by step.

Choose Location

If desired, you can log information about the location at which you are performing the test. The information will be stored in the Auto Test file along with the measurement data. It will be available when viewing and printing the Auto Test results. This first screen presents you with a list of available locations. To create a new location, press the + soft key. Press − to delete the location highlighted in the list. Press OK to select the highlighted location and continue to the next step.

Tip
If you are not interested in logging the information, select NONE from the list. Your MicroStealth will present you with only the steps required to configure the test.

Tip
You can rename the location highlighted in the directory by pressing the SHIFT + keys. A screen will appear asking you to enter a new name.

New/Edit Location

This screen is where you enter the information for a new or existing location. Use the up and down arrows to select the item to be edited. The items that appear in the list depend on the type of location you have selected. If you regularly perform tests at this location, you can save it for future use so that you only need to enter the information once. To do this, press the soft key and enter a name for the location. When you are done editing, press OK to continue configuring the Auto Test.

Note
Your MicroStealth will remind you when you have not stored the location. You should only do this, however, if you think you will return for another test.

Choose Probe Point

Some location types have multiple points at which you can make test measurements. If you have selected such a type, this screen will appear. Use the up and down arrows to choose the appropriate probe point from the list and then press the OK soft key.

Measure Voltage

You can log voltage measurements that you make using your multimeter. These will appear when viewing or printing the results of the Auto Test. When you have finished entering the measurements, press the OK soft key.

Compensation

Compensation is added directly to the signal level measurements. You can use this to compensate for losses associated with probe points found on certain amplifiers. The default is the Probe Compensation value specified in Configure. Enter a different value if necessary. Press the OK soft key to continue.

Results File Name

Enter the name you want to use for the results file that is created. Your MicroStealth will let you know if there is already a results file with the name that you enter. If desired, you can overwrite an existing file of the same name. When you are ready for the next step, press the OK soft key.

Type of Test

Tests can be executed immediately or scheduled over a period of time. Use the up and down arrows to select the type of test you want and then press the OK soft key.

Set Schedule

This screen will appear only if you have selected a scheduled test. The default schedule will perform four intervals over a twenty-four hour period beginning at the present time and date. If you require a different schedule, use the up and down arrows to edit the schedule and then press the OK soft key.

Temperature

The ambient temperature at which the test is performed is recorded. Your MicroStealth contains an internal temperature sensor for this purpose. If you prefer to use your own thermometer, you can manually enter the temperature here.

Important
For scheduled tests, the manual temperature entry is used for the first interval only. Subsequent intervals will record the temperature as measured by the internal sensor. For accurate measurements, MicroStealth reads the internal temperature sensor immediately upon power-up.

When you are ready to begin the test, press the OK soft key.

PERFORMING AN AUTO TEST
The following screen appears when MicroStealth is performing Auto Test measurements:

The number, type and carrier frequency of the channel currently being measured is displayed. The bar graph indicates the percentage of channels measured.

If you are performing a scheduled test, the time remaining until the next interval will appear upon completion of the measurements.

Important
To conserve battery life, your MicroStealth will automatically shut itself off between scheduled intervals.

When the auto test is complete, MicroStealth will display a list of Auto Test files that are available for viewing and printing.

Note
See the section on VIEW mode to find out how to access files from Auto Tests that you have performed.

CANCELING AN AUTO TEST
While performing an Auto Test, you will not be able to select other modes without first canceling the test in progress. Doing this will result in an incomplete test — you will not be able to resume the previously configured test.

Press the ⊘ soft key to cancel the Auto Test. MicroStealth will display a warning message and ask you to confirm your request.

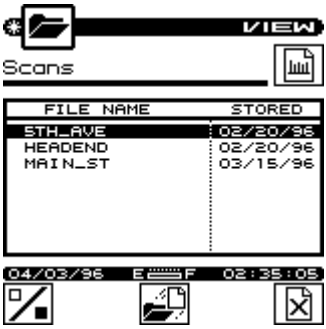
VIEW

To access measurement files that you have stored in your MicroStealth, choose the icon from the NAVIGATOR. Files are categorized into Installations, Scans (including Tilt measurements), and Auto Tests.

Use the up and down arrows to select the type of file that you want to view from the main menu and then press the key.

THE FILE DIRECTORY

Upon selecting the file category from the VIEW main menu, you are presented with a directory of existing files. For example, below is the directory of Scan files:



To view a file, use the up and down arrows to highlight the name of the file that you want to view and then press either the soft key or the key.

To delete the highlighted file, press the soft key. You can delete more than one file at a time by selecting multiple files using the soft key. Each press of this soft key alternately selects and deselects the file that you have highlighted. An indicator appears in the left-hand column to show that you have selected the file. Select all the files that you want to delete before pressing the soft key.

Tip
You can print Installation and Auto Test files from the directory. To print an Installation or Auto Test file, use the up and down arrows to highlight the name of the file that you want to print and then press SHIFT + . If a scheduled type Auto Test is highlighted, all intervals contained in the file will be printed. You must view Scan files in order to print them.

Tip
You can rename the file highlighted in the directory by pressing the SHIFT + keys. A screen will appear asking you to enter a new name.

VIEWING INSTALLATION FILES
You view Installation files using the Installation results screens described earlier in this manual. When viewing a file, you can print a comprehensive report of the installation results by pressing the SHIFT + keys.

Note
When viewing an Installation file, the date and time that the file was stored appears in the status bar and the file name appears at the top of the screen above the title bar.

Tip
You can resave an Installation file by pressing the SHIFT + keys. This allows you to change the name of the file.

VIEWING SCAN FILES

There are three types of scans that you can store and view — full scans, six-channel scans and tilt measurements. The type of scan depends on which screen you are in when you store the file. Once the scan is stored, you cannot change its type.

Tip

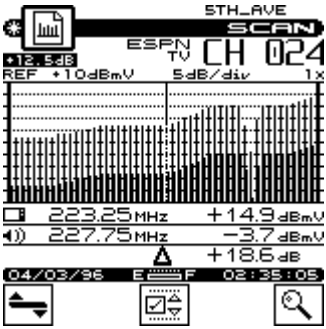
You can tell what type of scan you have selected in the directory without having to view it. Just look at the icon in the upper right-hand portion of the screen directly below the title bar:

FULL SCAN

SIX-CHANNEL SCAN

TILT MEASUREMENT

You view Scan files using the same screen in which the file was stored. For example, the following screen is used to view full scan files:



Important

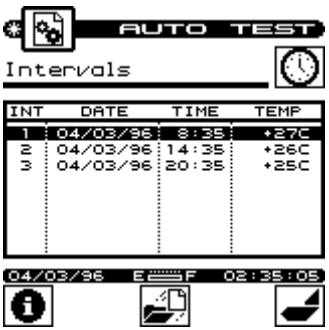
When viewing a Scan file, you can adjust the screen settings the same as when you are viewing a "live" measurement. These settings are described earlier in this manual.

Note
You can print the entire screen at any time by pressing the SHIFT + keys. A bar graph appears indicating the status of the printout.

Note
When viewing a Scan file, the date and time that the file was stored appears in the status bar and the file name appears at the top of the screen above the title bar.

Tip
You can resave a Scan file by pressing the SHIFT + keys. This allows you to change the name of the file and/or save any changes you have made to the screen settings.

VIEWING AUTO TEST FILES
Upon selecting the desired Auto Test file, you are presented with a list of intervals that are contained within the file. The list includes the interval number, date, time and temperature when the interval was recorded.



Note
Immediate type Auto Tests consist of only a single interval.

Press the soft key to view information about the Auto Test file. This displays the information that was logged when you configured the test. The items presented depend upon the location type that you selected.

Note
To print a 24-hour format report, use the up and down arrows to highlight the first interval that you want included in the report and then press SHIFT + . The report will include the highlighted interval plus the following three for a total of (up to) four intervals.

To view the measurement data from an interval, use the up and down arrows to highlight the desired interval then press either the soft key or the key. There are three screens in which the data is presented:

The first screen that will appear is a tabular list that includes the video and audio carrier levels along with the delta V/A for each channel. Use the up and down arrows to scroll through the list.

Indicators appear within the list to flag out-of-limit conditions. The following table relates each indicator with its meaning:

*	adjacent channel limit violation
↑	over limit violation
↓	under limit violation
>	over range measurement error
<	under range measurement error
E	unlocked measurement error

To view the data for the channel highlighted in the list press the soft key or the key. Use the PASS/FAIL indicator to quickly determine whether the channel has passed the limits check. If the channel failed, you can identify the reason(s) for the failure by looking at the symbols that appear in this indicator.

Press the soft key or the key again to scroll to the limit check summary. To quickly determine the status of the overall limit check, look at the PASS/FAIL indicator located in the upper portion of the screen. This indicates FAIL if any channel is not within the required limits. For each limit, the worst case value is displayed along with a pass/fail status.

Press the soft key to sequence through the available test points. The test point that you have selected is represented in the upper portion of the screen by one of the following icons:

	Subscriber Drop
	Ground Block
	Tap
	User Defined

Note
Be sure that you have enabled all of the test points that you are interested in using. The soft key is only available if there is more than one enabled test point. (see EDIT TEST POINTS).

Only the limits that are enabled in the selected test point will be checked.

Note
When viewing the data from an interval, you can print a comprehensive report by pressing SHIFT + .

3 Reference

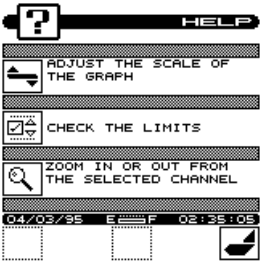
USING THE REFERENCE SECTION

This section provides additional information concerning the use of the MS1300. Items to be discussed include; Help, Information, and Technical Support.

HELP

The HELP mode provides on-line user assistance by means of context-sensitive help screens. During normal operations, soft key icons appear at the bottom of the display. Each help screen describes the condition of the soft key icons at the time HELP was pressed.

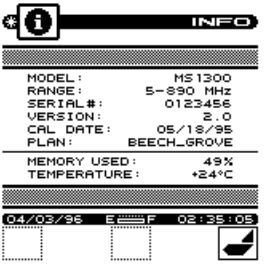
Press the SHIFT + ? key to select the HELP mode.



Next to the icon is a brief description of the function that the soft key performs. If an icon is currently inactive "feature not available" is displayed.

INFORMATION

Choose the icon from the NAVIGATOR. Here you can view information concerning your MS1300. The type of information includes; model, frequency range, serial #, firmware version, calibration date, and channel plan.



TECHNICAL SUPPORT

We've worked hard to make the MS1300 as easy-to-use as possible. However, if you have a problem using your unit you can contact Wavetek's Technical Support for help. You can reach Wavetek's Technical Support, Monday through Friday between 8 am and 5 pm at **(317) 788-5960**. Wavetek also maintains a support forum on the Internet. You can leave messages and a Technical Support Specialist will get back to you at Internet address: CATVSUPPORT@wavetek.com.

If you received your unit and found it to be damaged or incomplete in any way, phone Wavetek immediately. Save the shipping carton and packing material in the event that you have to return it.

FOR CUSTOMER SERVICE call: WAVETEK (800) 851-1198, International Customers, contact your local Wavetek Representative.

A Appendix A: Specifications

SPECIFICATIONS

Frequency

Range:	45 to 550 MHz; 45 to 890 MHz (optional); sub band option (5 to 45 MHz)
Accuracy:	±10kHz @ 25°C; (±20 kHz over temp.)
Tuning Resolution:	25 kHz

Level Measurement

Range:	-20 to +50 dBmV
Resolution:	0.1 dB
Accuracy:	±0.75 dB Flatness; ±0.75 dB Linearity

Scan Mode

Number of Channels:	120
Scan Rate:	Approximately 6 carriers / second

General

Dimensions:	4.25" (W) x 10" (H) x 2.5" (D)
Weight:	0.8 kg (1.75 lb.)
Operating Temp. Range:	-10 to +50°C (14 to 122°F)
Water Resistance:	Meets or exceeds MIL-STD-810D (Method 506.2)

Powering

Battery Life:	3 hours continuous (backlight off), replaceable battery cartridge
Charge Time:	16 hours with unit off; 30 hours slow charge (with unit operating)

Standard Accessories

4010-00-0114: microStealth AC/DC charger/adapter
1219-00-1223: Battery cartridge for microStealth

Options

MSUHF: Frequency extension to cover range: 45 to 890 MHz
MSSUB: Frequency extension to include 5 to 45 MHz
1019-00-0476: microStealth Soft Carrying Case
1019-00-0470: Cloning Cable
1019-00-0480: Multiple battery cartridge charger
4010-00-0114: Charger/Adapter 120VAC to 18 VDC
1019-00-0473: Charger/Adapter 220VAC to 18 VDC
1219-00-0123: Field replaceable microStealth battery cartridge
P-Stealth: Portable serial thermal fusion printer kit
1019-00-0468: P-Stealth printer cable
1019-00-0467: Generic serial printer cable - 25 pin male connector
1019-00-0469: microStealth to PC Cable

Appendix B: Power Management and Battery

Battery Pack Location and Installation

The MS1300 battery pack is located on the back of the unit. To remove or replace the battery pack, pull the notched tab downward, and lift up the battery pack.

To install the battery pack, insert the bottom of the pack into the groove and press down on the battery pack until it clicks into place.

Charging the Battery Pack

To recharge the battery pack, plug the AC adapter into the unit. The unit will reach fully charged in 16 hours with unit off, and 30 hours with unit operating.

Battery Tips

The MS1300 is shipped from the factory only with a light charge. You should recharge the battery upon receipt of your unit to ensure a full charge.

To maximize battery life, set Auto Shutoff to 1 minute and Backlight Shutoff to "always off".These items are described in the Global Configuration section.

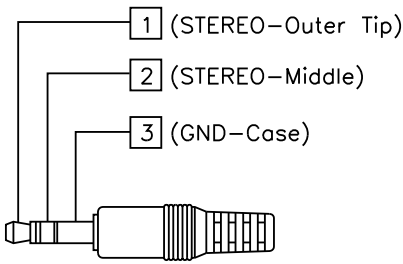
Appendix C: Interface Port

CONNECTOR

The MS1300 has a serial interface with RS232 drive, using a 3-pin stereo connector. The serial interface has a driver built in for RS232 serial binary data interchange. The connector is located on the bottom of the unit behind a waterproof cover.

Pin Assignments for Interface Port

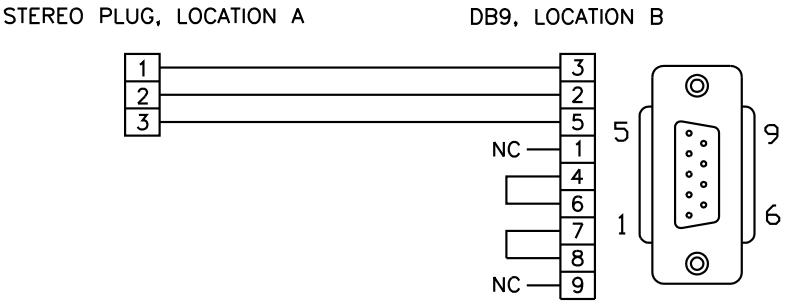
Signal	Pin	Description
TXD	1	Transmitted Data
RXD	2	Received Data
GND	3	Ground



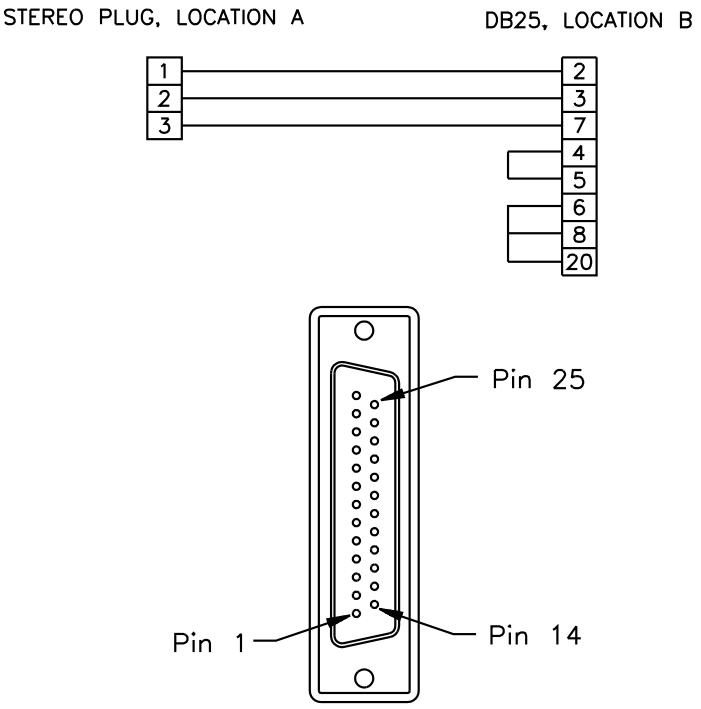
STEREO PLUG DETAIL

CABLE SPECIFICATIONS

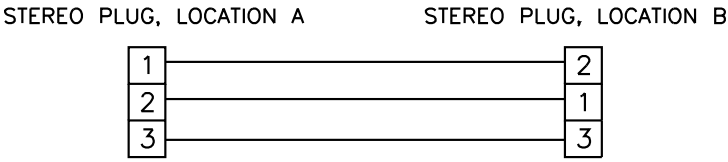
MICROSTEALTH TO PC (1019-00-0469)



MICROSTEALTH TO PRINTER(STANDARD) (1019-00-0467)



MICROSTEALTH TO MICROSTEALTH (1019-00-0470)



MICROSTEALTH TO PRINTER(CITIZEN) (1019-00-0467)